

What is claimed is

1. A process for producing monodisperse ion-exchanger gels with a particle size of from 5 to 500 μm , characterized in that
 - a) a non-crosslinked monodisperse seed polymer (with a particle size of from 0.5 to 20 μm) is produced via free-radical-initiated polymerization of monoethylenically unsaturated compounds in the presence of a non-aqueous solvent,
 - b) an activated styrene-containing monomer mixture is added as feed to this seed polymer, the monomer mixture is permitted to penetrate and swell the seed, and the mixture is polymerized at an elevated temperature, and the steps of addition of monomer mixture, penetration and swelling, and polymerization are, if appropriate, repeated one or more times, and where during the final addition the monomer mixture comprises from 2 to 50% by weight of crosslinking agent, and
 - c) the resultant polymer is converted via functionalization into ion exchanger.
2. The process as claimed in claim 1, characterized in that cation exchangers are produced via sulfonation in step c) of the process.
3. The process as claimed in claim 1, characterized in that anion exchangers are produced via amidomethylation with subsequent hydrolysis in step c) of the process.
4. A monodisperse ion-exchanger gel with a particle size of from 5 to 500 μm , obtainable via

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- a) production of a non-crosslinked monodisperse seed polymer with a particle size of from 0.5 to 20 μm via free-radical-initiated polymerization of monoethylenically unsaturated compounds in the presence of a non-aqueous solvent,
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- b) addition of an active styrene-containing monomer mixture as feed to this seed polymer, permitting the monomer mixture to penetrate into and swell the seed, and polymerizing the mixture at an elevated temperature, if appropriate with one or more repetitions of the steps of addition of monomer mixture, penetration and swelling, and polymerization, and where during the final addition the monomer mixture comprises from 2 to 50% by weight of crosslinking agent, and
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- c) functionalization by means of a sulfonating agent to give cation exchangers or via amidomethylation with subsequent hydrolysis to give anion exchangers, or chloromethylation with subsequent amination.